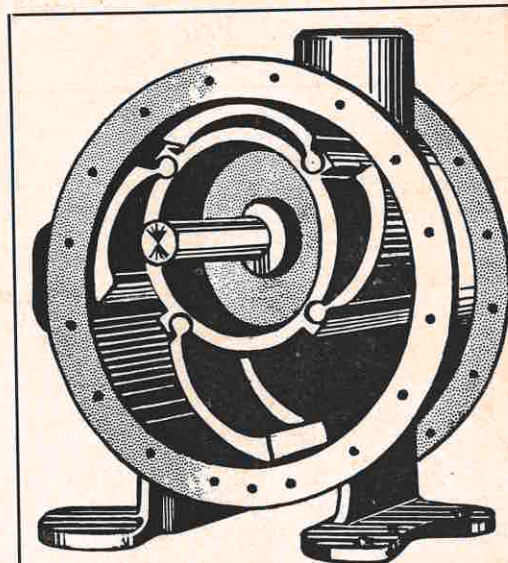


6/26

JAN 20 1915

LEIMAN BROS. ROTARY POSITIVE

VACUUM PUMPS



Examine the illustration showing the interior of the machine above and you need not be an expert mechanic to see why they are so very effective. To see why they take up their own wear. To see why they can maintain a very high vacuum. Notice also the comparative size of the piston and the cylinder, and also the large interior capacity or displacement of the pump. Compare these features with any other vacuum pump you have ever seen and then we are sure of what your decision will be.

POWERFUL—EFFICIENT—NOISELESS
THEY TAKE UP THEIR OWN WEAR

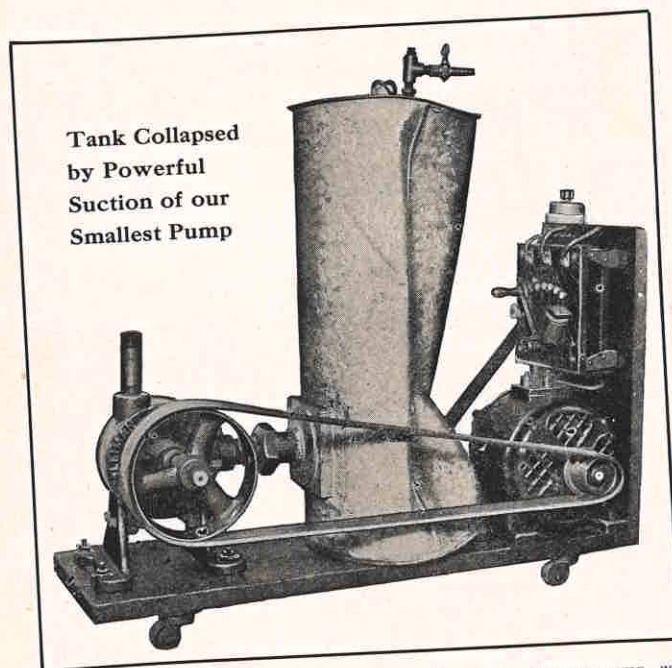
LEIMAN BROS.

62 JOHN STREET NEW YORK, U. S. A.
Works, Newark, N. J.

LEIMAN BROS. POSITIVE ROTARY VACUUM PUMPS

7 SIZES \$21 to \$245

SINCE the introduction of improved appliances has brought vacuum cleaning to the state of perfection where it could be introduced into the average residence, the demand for vacuum pumps has increased in proportion. Needless to say, the vacuum pump had to be one which could be readily handled by the inexperienced.

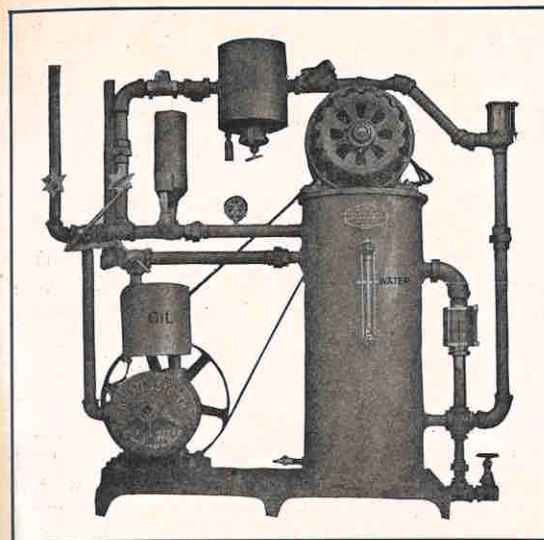


This picture shows the power of the smallest size vacuum pump we make. The tank was cross-braced inside and is of heavy galvanized sheet iron. While we do not recommend the pumps for more than 20 in. vacuum, this collapse occurred under test at 22 inches. A quarter horse power motor was used.

There are a number of different makes of pumps on the market at the present time, all of which are more or less efficient

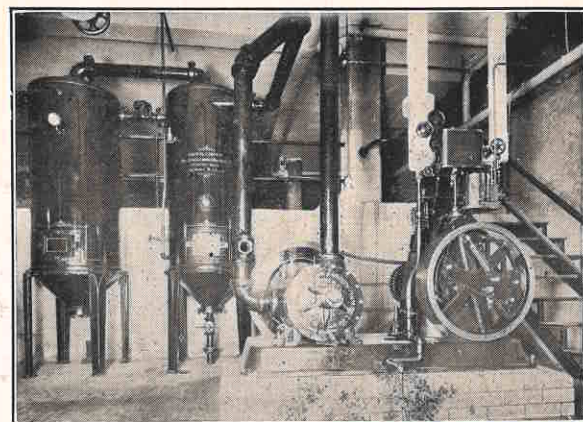
THE WESTINGHOUSE MACHINE COMPANY.
EAST PITTSBURG, PA., U. S. A.

We have at hand your letter of the 22nd instant, and in reply would advise that the size "C" vacuum pump which you supplied on our order A-7098 is giving satisfactory service.



This is the sort of vacuum cleaning outfit used in hotels and other large buildings. Any size pump from D to H may be used according to the size of the building. This shows the pump equipped for blowing as well.

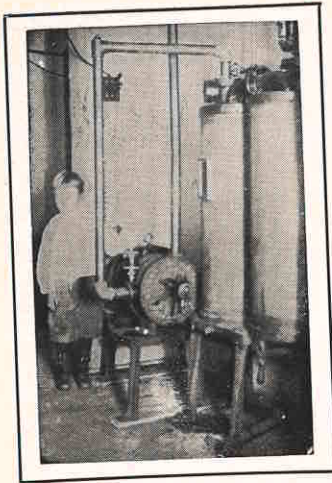
as well as probability, of a break down which will have to be taken care of by a mechanic. Needless to say this incurs a certain expense and loss of service of the machine. In these pages we shall endeavor to give a description of the machines which



A large outfit for a hotel, Commercial Building or Institution, using size H Pump with 4 Sweepers. About 300 feet of pipe and hose.

JANCOVIUS & SON.
NEWARK, N. J.

Regarding your inquiry of the 9th, would say that both of the vacuum pumps which we purchased, have been and are giving most satisfactory service. We have had absolutely no trouble or expense on either, and should we require any more of these pumps, we would certainly purchase your make.



Stationary Outfit, size E Pump, 2 h. p. Motor. About 100 feet pipe and hose.

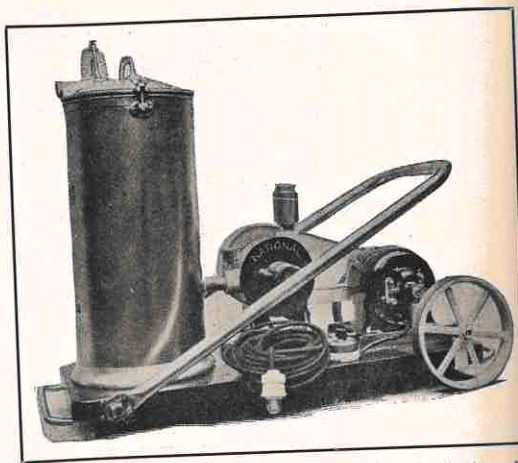
ance, therefore, of having a machine that is capable of taking up its own wear is apparent.

In mentioning a leak in the machine we do not mean that it is necessary to have an opening wide enough to feel the air escaping by passing the hand over it—the slightest pin hole or other crevice will greatly affect the degree of vacuum secured.

You will note by referring to the illustration showing the interior of our machines that they

we offer, not only for vacuum-cleaning work, but for any other work requiring a vacuum at from 1 to 20 inches. The machines which we will describe may also be used for blowing wherever a pressure is required at from 1 oz. to 10 lbs. This pressure is obtained not by reversing the rotation of the machine, but by utilizing the outlet instead of the inlet, as is the case when used for vacuum.

In the first place, a vacuum pump to be efficient must not leak. If it leaks then this means that in order to secure satisfactory results a larger amount of air must be used to overcome the effects of the leak than would otherwise be the case, meaning the use of a larger and more costly pump. The import-



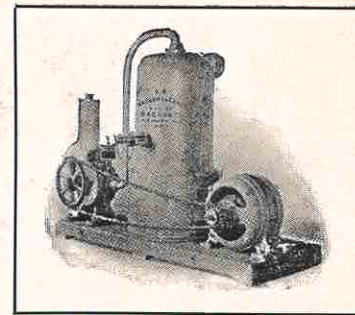
A portable vacuum cleaning outfit like this is low in price and exceedingly effective when equipped with one of our pumps. We do not manufacture these outfits, but simply supply the pumps.

L. C. GARVIN.
YORK, PA.

Replying to your inquiry of the 22nd inst., regarding the working of the Size D vacuum pump purchased from you over one year ago, I am pleased to tell you that the pump is driven by a 1 h. p. A. C. motor and is giving *most excellent service*.

depend entirely upon centrifugal force to take up their own wear. This centrifugal force—being a natural force—is always present in rotating bodies and, therefore, no matter how old the machine may be, this force is always present and always powerful. It keeps the wings tightly against the cylinder while the machine is in operation and thereby does away with all leakage.

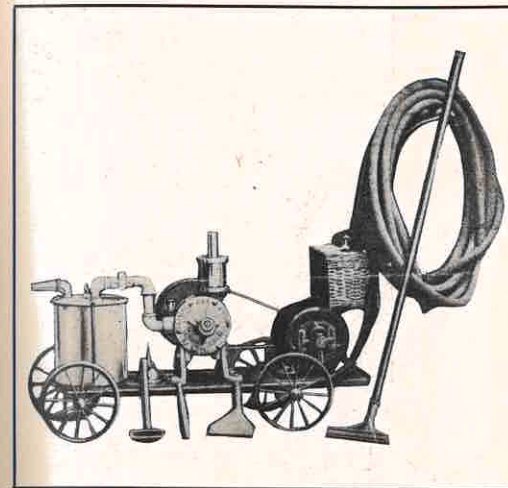
Contrast this form of construction with that utilizing the service of springs, cams, etc. These artificial means of taking up wear are themselves subject to wear and breakage and when a severe strain takes place they weaken and break. Centrifugal force does not do this, but becomes more powerful the greater the strain placed upon it.



A small vacuum cleaning outfit, size C Pump, ½ h. p. Motor. Large enough for an ordinary residence, about 60 feet of pipe and hose.

The small piston which we employ leaves a large air space and this means that a smaller machine of our make may be used than is the case with other machines displacing the air at the same degree of vacuum. On page 20 we give information in regard to the proper selection of a machine for any size vacuum-cleaning outfit.

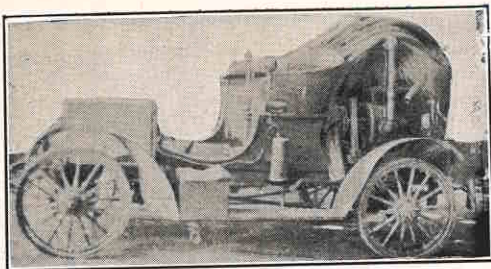
We manufacture simply the



This is another form somewhat similar to that shown opposite and very effective work may be done. An idea of its power may be gained by referring to the equipment of hose which is part of the outfit. The pumps only are supplied by us.

GEORGE STEEG.
WAVERLY, PA.

It is about a year that I have had the vacuum pump in use, using it for a stationary vacuum cleaning plant; it has given the best of satisfaction and fills the bill in every way.

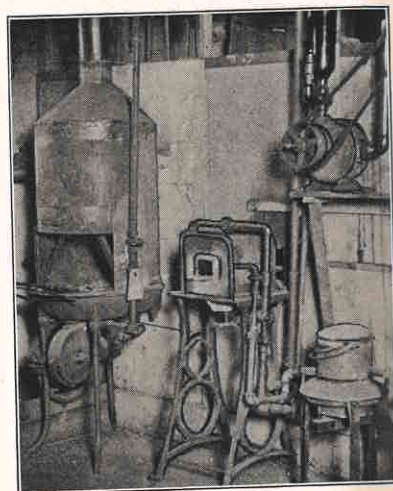


A size E pump with 100 feet of hose and automobile engine drive.

vacuum pump is the heart of the outfit without which no work can be done. You need not be a mechanic to see the advantage derived from using a pump that requires absolutely no attention beyond oiling—one that cannot get out of order—and one that will last practically a lifetime. We do not simply make these claims in order to sell one or more pumps, but we hold them up for comparison with other forms of the rotary vacuum pump now on the market. It is, of course, understood that the rotary form of pump is much more efficient than the piston-type pumps for small capacities such as those offered in the seven sizes in which these pumps are manufactured by us.

Consider for a moment the straight or flat vane type of vacuum pump. This type of machine must be equipped with a large piston to give support to the vanes, which, of course, reduces the available inte-

rior air space. It takes up the wear of the wing tips by means of springs, cams, or other artificial devices which, of course, as stated above, are subject to wear and breakage themselves. These flat vanes slide back and forth in the piston in such a manner that there is always some side play between the wing itself and the piston slot in which it slides. No means is provided for compensating for this wear.



This illustration shows one of our pumps used as a blower, supplying air for a melting furnace, for a hardening furnace, and for a forge. The forge, it will be noticed, is an old style coal forge equipped with a hand blower which in this case is not used, the required amount of air being supplied by our pump.

SCOGGIN BROS.
MARYSVILLE, CAL.

Yours of Nov. 28 just at hand, and am very glad to recommend your vacuum pump. It has proved very satisfactory to me and without any trouble or expense. We first hooked up to a 12 horse auto car, but the car was in very bad shape, so we discarded the auto car, and now we are hooked up to a 30 horse Mitchell, and are working every day. We have investigated a number of pumps, but yours has proven the best of all.

rior air space. It takes up the wear of the wing tips by means of springs, cams, or other artificial devices which, of course, as stated above, are subject to wear and breakage themselves. These flat vanes slide back and forth in the piston in such a manner that there is always some side play between the wing itself and the piston slot in which it slides. No means is provided for compensating for this wear.

The impellor type of vacuum pump is not supplied with the means of taking up its wear, which is part of the equipment of the sliding-vane type just mentioned. Instead, the impellers are fitted when the machine is made, but after some length of service the constant contact of the wings with the cylinder, and with each other, results in a clearance which, needless to say, does not benefit the machine or improve its efficiency.



An outfit using Size G Pump with 250 feet of Hose and 5 1/2 H. P. Two Tools.



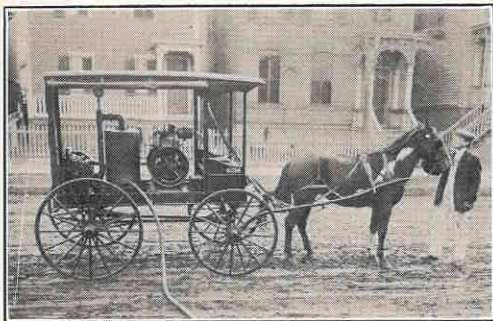
An automobile outfit may be equipped with size E, F, G or H pump for effective vacuum cleaning work.

The fan-type machine which is sometimes supplied with vacuum-cleaning outfits, need not be seriously considered as it is not a positive pump, creating simply a draft of air not powerful enough for any effective work.

The piston-type machine previously

JOHN ALLEN.
NEWPORT, R. I.

Yours received, the pump is working all right, use it about 8 hours each week. I pump about 50 ft. in my house and have a pipe to the next house that has 125 ft. of pipe. It seems to do as good work there as in my house.



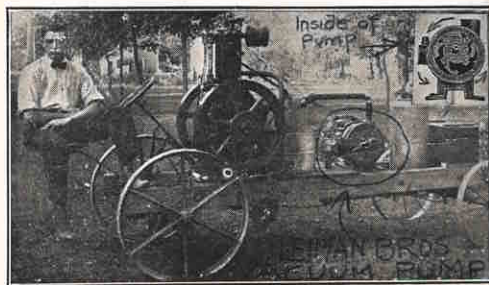
A wagon outfit, using Leiman Bros., Size F Vacuum pump with 200 feet hose and 3 horse power.

as efficient in regard to power. New piston rings, of course, do not fit accurately in a worn cylinder and leakage results.

These forms of construction are simply mentioned so that inference may be drawn as to their capabilities. As our pumps have already been supplied to some of the leading manufacturing concerns, not only in the vacuum-cleaning industry, but in most other industries where the machines are used as pressure blowers as well, we do not fear these comparisons and, in fact, invite them at all times in order that the purchaser may be certain that he is getting what he thinks he is buying.

Up to this point these vacuum pumps have been considered only for vacuum-cleaning work, but there is an increasing demand for them for other uses which exceed the demands for vacuum-cleaning work.

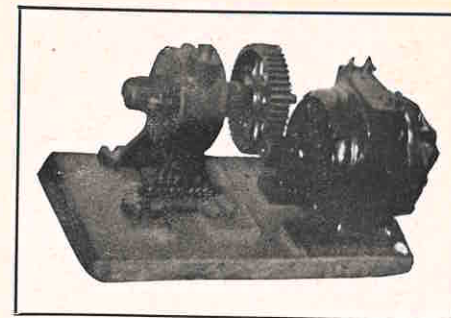
Many manufacturers of automatic machinery have adopted these machines and are installing them in connection with their machines for doing work which formerly was performed by manual labor. These pumps



A gas Tractor using one of our Pumps for Vacuum Cleaning.

referred to is sometimes supplied with vacuum-cleaning outfits, but with what a waste of power. These machines are supplied with piston rings for taking up any wear which takes place, but these again are placed in the same class with the sliding-vane-type pump and are not nearly

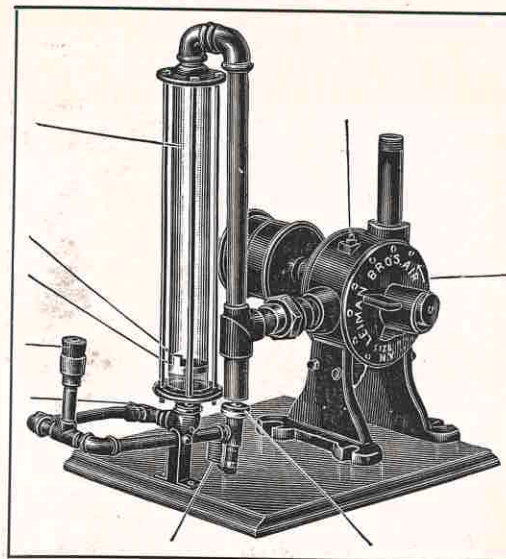
being automatic themselves in the matter of taking up their own wear are especially adapted for these purposes, and they are therefore used with profit on printing presses for lifting and feeding the paper, and they do it in the most efficient manner. For feeding nails in automatic box-nailing machines they have been found satisfactory, and for testing gas fixtures and fittings for leaks in the course of their manufacture.



It is not always desirable to connect these vacuum pumps direct to the motors as shown, although in some cases this is the only form of connection which can be utilized. In such cases we are prepared to supply outfits like the above.

The machines are used for removing foul air and supplying fresh air in its place to rooms in remote parts of buildings, and in such cases are also used for vacuum cleaning in the same buildings.

They are utilized for supplying the necessary air or suction for automatic cash-carrier systems, and have been connected to automatic machines for operating church chimes, calliopes and other musical instruments.



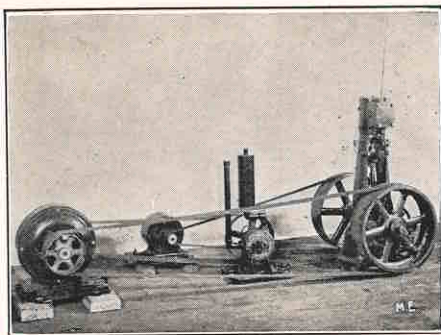
An exceedingly effective machine is shown for detecting leaks in gas fixtures and fittings. This machine is in use in most of the factories turning out this class of goods.

GEO. WEBNER & CO.
NEWARK, N. J.

High pressure blower we bought of you has been in daily use since Dec., 1904. We have examined same very carefully to-day, and by all appearance find blower fully capable of another ten years of good hard service.

D. R. CAMPBELL, M. D.
PULLMAN, WASHINGTON.

In reply to your inquiry of August 16, will state that the vacuum pump purchased from you is doing effective service.

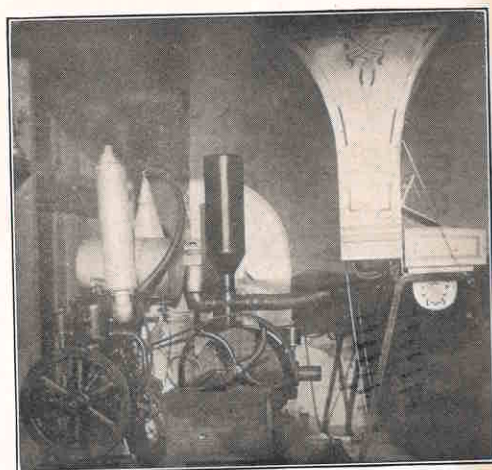


This illustration shows a wireless telegraph outfit with which is incorporated one of these pumps, the air jet being utilized for clearing the spark gap whether it be open or enclosed. We simply supply the blowers which can be operated with any small motor.

before it reaches the interior of the pump.

Massaging, which has formerly been exclusively performed by the hands, as well as vibration work, which is accomplished by means of electrical and other mechanical devices, is now performed with the vacuum pump by means of the powerful suction which is found very beneficial when used in conjunction with the special machines now on the market for this purpose.

Vacuum pumps are very useful in connection with



This shows one of these pumps used for blowing. It furnishes a blast for operating a calliope, thus doing away with the use of steam.

BADGER METER MANUFACTURING COMPANY.
MILWAUKEE, WIS.

We acknowledge your favor of the 16th relative to the "D" blower, will say that before we bought it, it was highly recommended. This was one purchase that we made, which has proven highly satisfactory and we will say that we recommend it further.

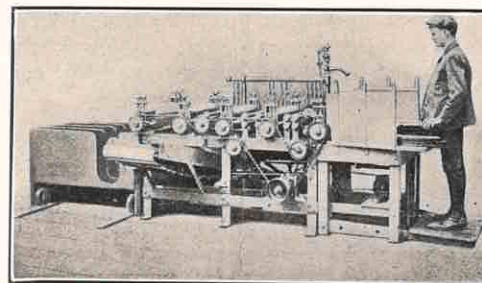
In the dairy industry milking machines have recently been introduced in large numbers and, therefore, rotary vacuum pumps have been found very suitable for this work, as the steady vacuum may be nicely regulated to the demands of the work, and they are also very nicely adapted for evaporating work for drying grain, fruits, and other produce where means are provided for separating the moisture from the air

laboratory work of all kinds, as the steady suction is very valuable for testing, and the pressure for use with blow lamps and assaying purposes.

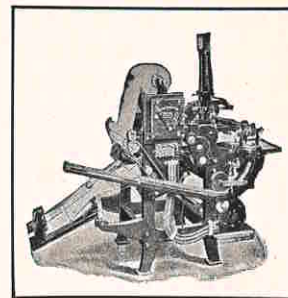
As before stated the machines are adaptable for blowing work and the number of sizes in which they are made make it an easy matter to secure just the right amount of air required. We have a special catalogue showing the machines as pressure blowers, and there are two smaller sizes than those listed as vacuum pumps, so that the range of air volume supplied is from 4 to 338 cubic feet per minute.

We show a number of illustrations and adaptations of these vacuum pumps for both suction and blowing, and some of these outfits we are prepared to supply complete and others are supplied by other manufacturers, and in each case we shall be very glad to give any particulars required.

Among the uses to which the machine may be put we will mention the following few, in order to show that the purchase of one of these pumps need not be for one particular purpose alone, as the air may be utilized in many other ways, making the investment a permanent and valuable one:



Cloth singeing machines such as shown in the illustration are equipped with these pumps, the blast or air being supplied in connection with the burners for doing the work. Needless to say a steady positive pressure is demanded and a machine that leaks in the slightest degree cannot, of course, be used.



Printing, wrapping, and mailing machines are now on the market where very little human attention is required. Our pumps are used in connection with them for handling and feeding the paper and for this work they are very efficient.

The air jet may be used for supplying a blast for use in blow pipes for such work as brazing, annealing, soldering and forg-

L. L. GRIDLEY COMPANY.
MILWAUKEE, WIS.

The size "B" pump which was purchased from you by Mr. Lord, gave excellent satisfaction, and in several days we expect that we shall send you an order for a size "E" pump. It might be well to have one in stock so that you can make immediate shipment when we send you the order.

ing. It is essential in such a case to have a steady volume and pressure, and for such work these machines excel.

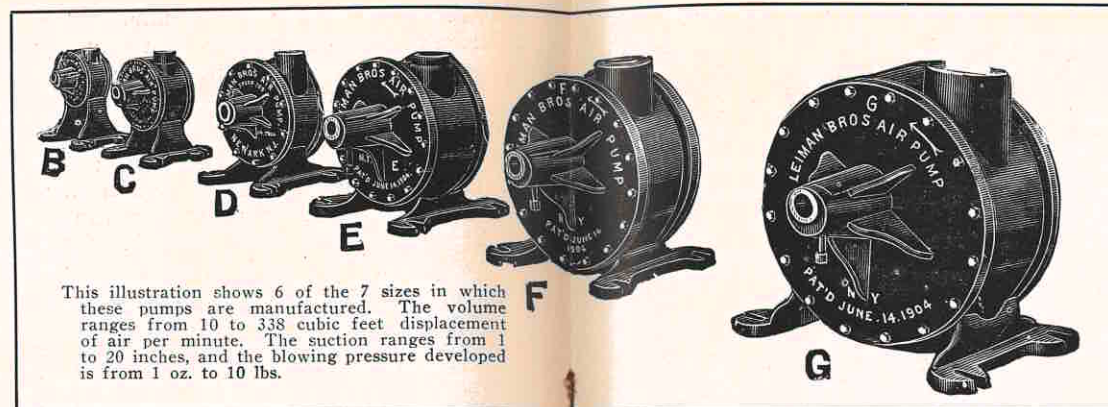
They may be used with furnaces burning oil, coal or gas, and used for melting of metals, hardening, tempering, etc. If you have a coal forge its efficiency may be greatly increased by applying the air from one of these blowers, instead of from one of the old-type fan blowers or bellows.

Oil-burning appliances use these machines with great satisfaction, due to the fact that the volume of air supplied may be nicely regulated, as also may be the pressure, and there are a great many of them being sold for this work in all parts of the world.

In using a wireless telegraph outfit the accumulation of metallic fumes and vapors, as well as other obstructive matter, may be removed and the spark-gap kept clear by employing the air jet, and one of these small pumps may be attached to a small motor and will supply the powerful blast necessary for this work, whether the gap be open or enclosed.

In power houses, shops and factories a great deal of dirt and dust accumulates in the interior of electric motors, especially in the commutators and armatures, but this is readily dislodged by means of the air jet.

Many gas companies employ these pumps which, when so ordered, are furnished gas tight for pumping gas and testing



BOSTON MUSICAL INSTRUMENT COMPANY.
BOSTON, MASS.

Referring to the Size E, Pressure Blower, we purchased from you, we want to say that same has been in constant daily use since we put it in, a matter of two years ago. It is giving absolute satisfaction in every way and we think we can truthfully say, the Blower is doing even more than you guaranteed it would do.

We use it in connection with our Gas Forges for heating the instrument bells. Before we got your Blower and the Gas Apparatus, we used Charcoal, which was old-fashioned, dirty, hot for the men, and really they proved more expensive than your Blower with the Gas Forges.

We can say, in general, that we have received best results and splendid satisfaction from the Blower, and purchased it of your people at a lower figure than quoted us for a very well known local Blower. You have our permission to use this letter if it will be a bit of use to you, as same is in reply of yours of the fifteenth. If we wanted another Blower tomorrow, we should buy it from your house.

mains and meters, also for supplying the gas at the proper pressure for high-pressure gas-lighting systems, for which a steady pressure is very valuable and essential. Gas companies also enjoy a large sale for them for commercial gas-burning appliances.

In laundries all sorts of machinery, pressing irons, etc.,

are heated by means of these pressure blowers, as also is done in large and small clothing factories, shirt houses, etc. In the glass industry, for blowing glass, where a large flame, or a fine, non-flickering flame is necessary, the machines are equally valuable, and they are used for bending art glass in molds.

Many forms of atomizing and spraying machines use these blowers for spraying light paint, varnish, etc., and they are also used for spraying disinfectants in orchards and gardens.

Another great use for the air pressure is sand blasting, which produces a mat finish or frosty effect on metal, glass, etc. This work is also utilized for placing letters and designs on bottles, for making signs of glass or metal, and for marking bottles and stoppers which are used in chemical laboratories so that the identification of the individual bottles and the stopper is made easy and rapid.

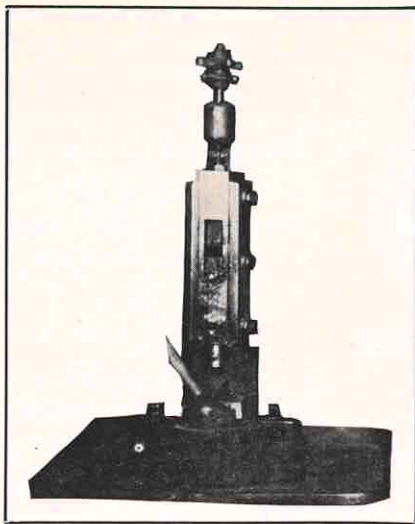
The sand-blast machine is fully described in another catalogue which we will be glad to supply you with if interested.

KARNS MANUFACTURING CO.
SPRINGDALE, PA.

In answer to your inquiry of 8-22-12, would say we installed one of your pumps at home and have had it under observation since installation about 4 years and has been entirely satisfactory for vacuum cleaning plant. We installed one two years ago for party in Greentree for same purpose and he says it is giving good service. Wishing you all success that your pump merits we are yours.

DOEHLER DIE-CASTING CO.
BROOKLYN, N. Y.

Replying to yours of the 3rd inst., wish to advise that your size F blower has given entire satisfaction in connection with our gas furnaces.

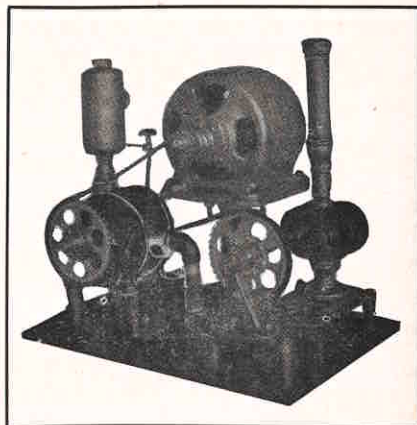


A stamping press supplied with a tube from which emerges a jet of air for blowing the stampings as fast as they are cut from the sheet, thus keeping the die clear at all times. This air jet may be utilized for blowing chips from machines and other work as well.

In vacuum cleaning the machines, of course, may be used for cleaning of railway cars, churches, public and private buildings of all sorts and, in addition, out-of-the-way parts which cannot be readily reached with the suction tool, are very easily cleaned out and all dirt dislodged by the use of the air jet. This air jet may also be used in all sorts of factories and shops

In operating calliopes and automatic piano players, where a volume and blast of air is required, these blowers are just the thing to give the best of satisfaction and many of them have been sold for this purpose.

In many shops and factories a blast of air may be utilized for blowing chips or stampings from machines, presses, etc., for which purpose they are largely used, and in other establishments for agitating and aerating solutions.



This is an outfit for supplying oil under air pressure for oil burning appliances of all sorts. These machines furnish the required pressure and volume of air and are highly recommended for the work.

EDISON CHEMICAL WORKS.

SILVER LAKE, N. J.

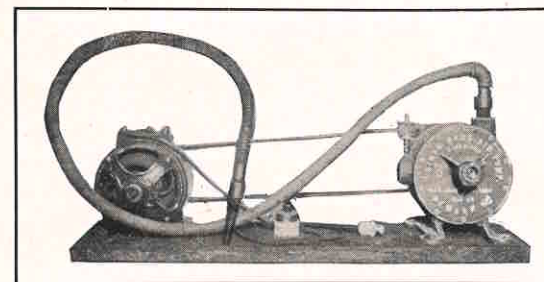
Replying to your inquiry of September 28, regarding pressure blower, we are glad to say that this blower is working satisfactorily.



This illustration shows one of our pumps used for blowing out dust and dirt from armatures and machine parts. Where a vacuum cleaning outfit is used the air jet may also be utilized for reaching parts which cannot be reached by means of the suction tool.

for cleaning the dust and dirt from interior or intricate parts of machines which are not readily reached by other means.

In a saw mill or wood-working plant, the air jet may be used for blowing dust and chips from the machines, and elsewhere for lifting sand and other light materials by air-pressure syphoning.



For brazing, bending art glass, cleaning by means of air jet and other work this outfit is recommended, and we are prepared to supply it complete as shown.

CLARK & COOMBS COMPANY.

PROVIDENCE, R. I.

Referring to your recent letter with reference to the blower now in use, we are pleased to state that after taking it down and making examination we find the blower to be in good condition, and apparently it runs with as little power as could be expected.

The aeration of milk, water, etc., is easily accomplished with one of these pumps, and the cleaning of metals, castings, cores, molds, etc., with the air jet or sand blast is very rapid.

Small whistles may be blown with the air blast by running a pipe to wherever it is necessary to use the whistle, and pro-



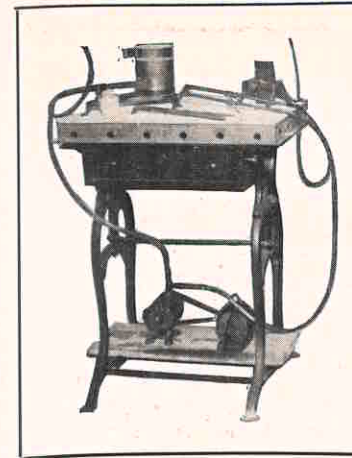
The sand blast shown is equipped with one of these pumps used as a blower. We have a special catalogue showing both the blowers and sand blast. Large numbers of these pumps are supplied for furnishing the air blast necessary for use in connection with sand blasting outfits such as shown above.

viding a valve so that the current of air may be shut off when the service of the whistle is not required.

In the textile industry the machines are used for cleaning looms by means of the air jet for applying a gas blast for singe-

HAAS & HOUGHTON.
ALEXANDRIA BAY, N. Y.

The pump I ordered from you came along all right and I have just got it working. It is very satisfactory in every way. I am surprised at the suction it has. I am running it with a $\frac{3}{4}$ horse power gas engine and am getting a stronger suction than my neighbor does with a ——— pump and a $1\frac{1}{2}$ horse engine. I can heartily recommend it.



This shows a complete outfit for melting, brazing, soldering, annealing, etc. One of our pumps is used for supplying the air blast and we are prepared to quote on a complete outfit.

Smoke or gas may be forced through water by means of the air blast in order to purify it and rid it of all particles of impurity. The blast is used also for testing purposes of many kinds, melting, etc.

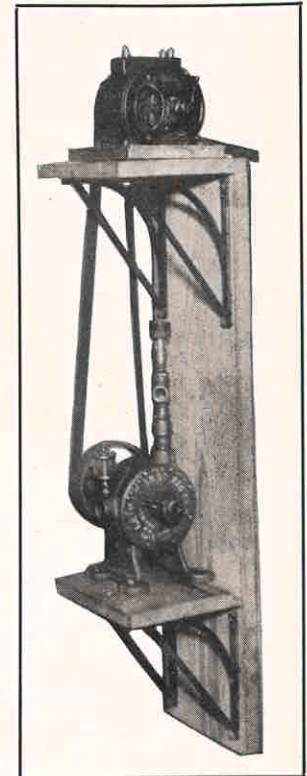
In the welding industry, or wherever the oxygen-hydrogen flame is employed, the blowers supply the necessary gas blast for pre-heating with ordinary city gas, and pipe lines are tested with the air pressure combined with smoke to detect leaks.

These vacuum pumps may be utilized for furnishing a suction for suction chucks used on lathes and other machines for holding light articles to be turned.

WATERHOUSE WELDING COMPANY.
PELHAM ST., BOSTON.

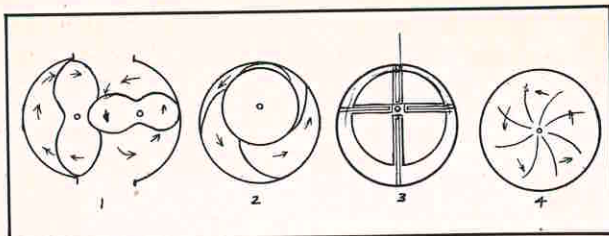
We have your letter of May 29 regarding blower we purchased from you and beg to advise that it has at all times worked satisfactorily. We use it for brazing purposes and superheating with coal gas in preparation for autogenous welding.

ing machines, agitating dyes, and at the same time may be used for spraying light paint on the walls of the factory, or utilized for vacuum cleaning so that the service of the pump may always be in demand.

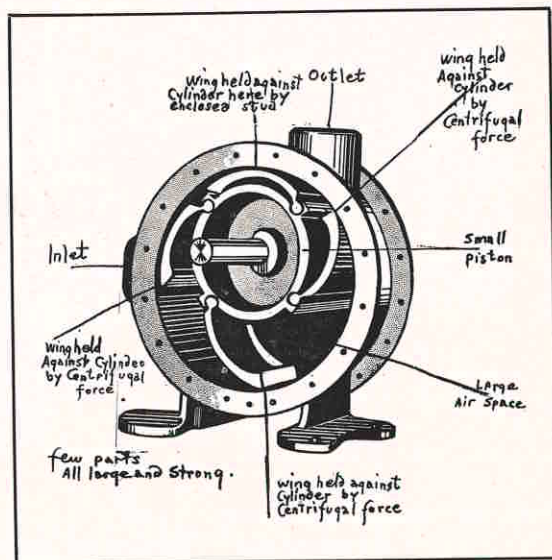


One of our pumps equipped as a blower and, with the motor, is supplied all complete as shown, including the scaffold which may be mounted on the wall and either the suction or pressure utilized.

Advantages of Our Form of Construction.



No. 1 shows the impeller type of pump. Nothing can take up the wear in the center where the impellers touch, nor where they come in contact with the cylinder. No. 2 shows the sliding vane type of pump. The wings sliding back and forth in the piston are subject to wear at the sides where they come in contact with the piston and nothing can take up this wear. This results in leakage. No. 4 shows a fan type pump where the wings do not touch the cylinder. This not being a positive pump, it is not in the same class with the others. No. 2 shows our form of construction. Contrast the small piston with the one shown in figure No. 3. It leaves a large air space which is not available in figure 3 and the curved form of the wings depend on centrifugal force to take up their own wear as none of the others can.



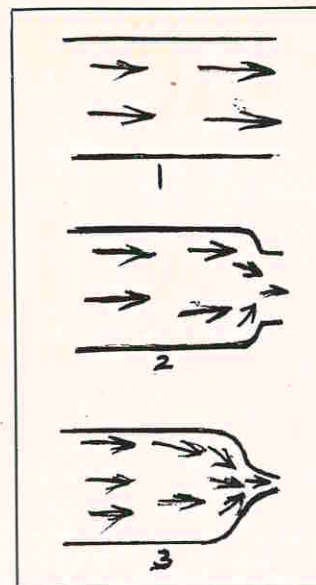
A few important points it is well to consider before buying any make of pump.

JOHN FINN METAL WORKS.
SAN FRANCISCO, CAL.

Received your favor of the 29th, and in answer would say, we are at the present time using two of your Blowers, one Model "F" purchased from you direct and one Model "D" purchased from your Agents here in San Francisco.

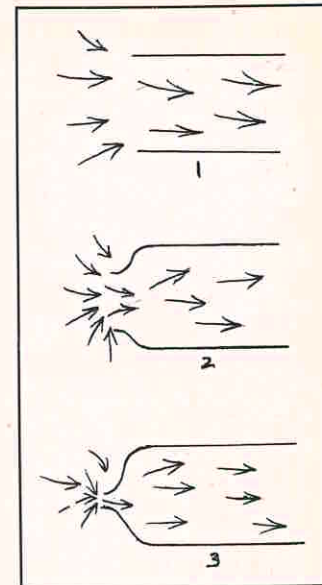
Would say in regards to these Blowers, that they have both given good service, and we have no fault to find with either.

How Air Pressure is Created.

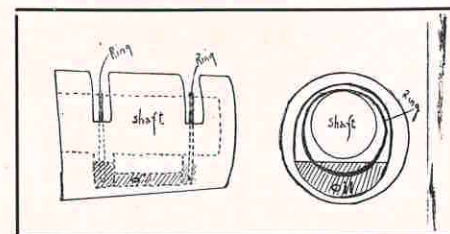


No. 1 shows a volume of air passing freely through a pipe creating no pressure. No. 2 shows the same volume of air passing through a pipe and emerging through a reduced opening thus creating pressure. No. 3 shows the same amount of air passing through a still smaller opening thus creating a higher degree of pressure.

How a Degree of Vacuum is Secured.



No. 1 shows how the air passes through a pipe freely not creating any degree of suction. No. 2 shows the same volume of air being sucked through a smaller opening thus increasing a degree of suction or vacuum. No. 3 shows a still smaller opening, but the same volume of air, resulting in a still higher degree of vacuum.

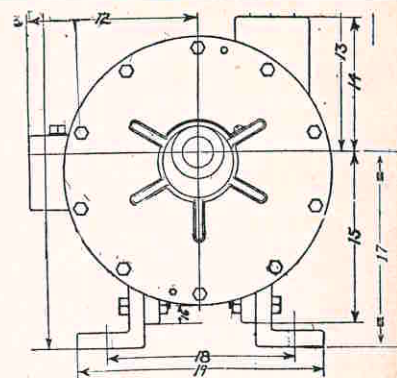
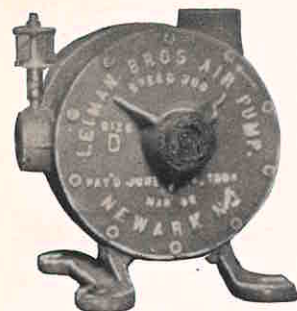


The 7 sizes of Leiman Bros. vacuum pumps are equipped with double ring-oiler shaft bearings on each side of the machine, and when these oil wells are kept filled with oil the rings keep the shaft lubricated while the machine is in operation.

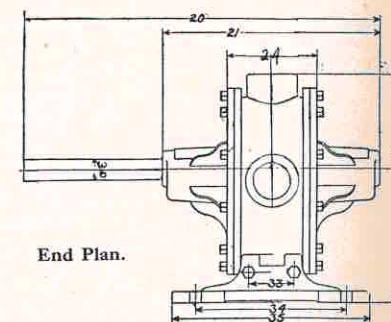
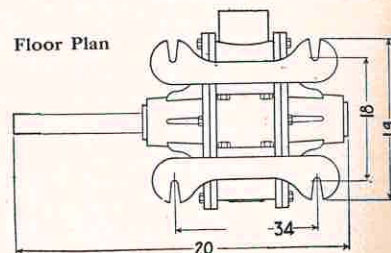
PERRY D. FRAZER.
RIDGEWOOD, N. J.

The vacuum pump I purchased from you three years ago is still in perfect condition, although it has been used a great deal in my work. I have not had the least trouble with it and it has not cost a cent for repairs. I have taken it apart and cleaned it twice, as I remember it. It is giving satisfaction.

PRINCIPAL DIMENSIONS of LEIMAN BROS. ROTARY POSITIVE VACUUM PUMPS



Side Plan.



End Plan.

	B	C	D	E	F	G	H
12	3 7/8	4 5/8	6 1/4	7 1/4	8 3/8	10 1/2	11 1/2
13	5 1/2	6 1/2	7 3/4	8 1/2	10 1/2	13	16 1/4
14	3	4	5	5 1/2	7	8	10 1/2
15	4 1/4	4 9/16	6 1/8	8	8 5/8	10 5/8	9 1/2
16	3 3/4	4 3/8	1	1 1/2	1 1/2	3 3/8	
17	5 1/2	6 1/2	7 1/4	8 1/2	9 1/2	11	11
18	6 1/4	7	7 1/2	10 1/4	12	15 3/8	16 1/2
19	7 1/2	8 1/2	9 1/2	12 1/2	14 1/2	18 1/2	18 1/2
20	11 1/2	14 1/2	19	24 1/2	28 1/2	33 1/2	46
21	7 1/4	9 1/4	11 1/2	17 1/2	19	23	35 1/2
24	2 7/8	3 3/4	4 3/4	7	7	9	19 1/2
30	1 1/8	1 1/8	1	1 1/4	1 5/16	1 9/16	2
33	1 1/4	1 3/4	2 3/8	3 3/8	3 1/4	4 3/8	13 3/8
34	4 3/8	5 1/8	8	9 3/8	9 3/8	11	13 3/8
35	6 3/8	7 3/8	10 3/8	12 1/4	12 1/4	14 1/4	16 1/4
37	8 3/4	10 1/4	12 3/4	13 3/8	16	19	21 1/4

DISPLACEMENT, POWER, SPEEDS, ETC.

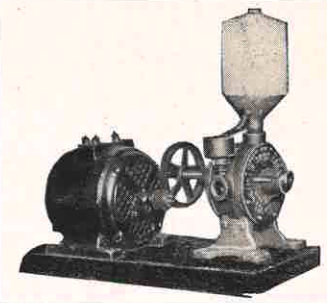
Pump Sizes	B	C	D	E	F	G	H
Displacement, inches per rev	30	80	200	400	675	1400	2592
Revolutions per minute	600	400	300	250	200	200	200
Approximate horse power	1/4	1/2 to 1	1 1/2 to 2	3 to 5	5 to 8	8 to 15	
Suction or vacuum	1 to 20 in. but not higher than 12 in. steadily						
Blowing or pressure	1 oz to 10 lbs but not higher than 6 lbs steadily						
Inlet—outlet, threaded, inches	3/4	1	1 1/2	1 1/2	2	2 1/2	4
Vacuum-Cleaning Capacity in pipe and hose length—feet	40	60	80	100	200	250	300

Oil Cups, Automatic Oiling Systems, Vacuum Relief Valves



Sight-Feed Oil Cup

In oiling the cylinders of these machines the sight feed oil cup shown is generally used. By means of this the feed of oil may be nicely regulated and shut off when the pump is not in use. Where continuous service is demanded then the automatic oiling system shown is much to be preferred as a continual stream of oil is supplied without any attention. The price of these oiling devices is shown below.



Automatic Continuous Oil-Feeding System

In using a vacuum pump it is important to see that some means is provided to guard against damage to the pump or motor in case all openings are closed at once while in operation. In such a case the vacuum valve shown is used and when placed on the piping it closes automatically, preventing the vacuum from rising beyond a predetermined degree. The prices of the valves are shown below.



Vacuum Relief Valve

PRICES

LEIMAN BROS. ROTARY POSITIVE VACUUM PUMPS

Pump Sizes	B	C	D	E	F	G	H
Prices	\$21	\$28	\$42	\$51	\$75	\$125	\$245
Oil Cups	.70	.70	.70	.70	.90	.90	1.25
Oiling Systems	5.00	5.00	6.00	7.00	8.00	9.00	10.00
Vacuum Valves	2.50	2.50	2.50	3.00	3.00	3.00	3.00
Weights, lbs.	23	37	66	143	235	385	
Crated weights, lbs.	37	55	102	163	272	421	563
Boxed weights, lbs., export	37	75	130	201	329	497	
Cub. ft. shipping measures	1	3	5	7	13	18	

PULLEYS FOR VACUUM PUMPS

PULLEYS are not furnished with these vacuum pumps because of the fact that they are generally operated by means of electric motors, engines, or similar power units, in which case the speed and size of the driving pulley will determine the size of the pulley required for the vacuum pump. We are prepared to furnish suitable pulleys for this purpose at an extra cost when the speed and diameter and width of the driving pulley is given.

Formula for finding size of pulley required for vacuum pump. The speed of the driving pulley should be multiplied by its diameter and the result divided by the speed of the pump selected. Thus:—

$$\begin{array}{rcl} \text{Speed of driving pulley,} & - & 400 \text{ R. P. M.} \\ \text{Diameter of driving pulley,} & - & 4 \text{ Inch} \\ \hline & & 1600 \end{array}$$

1600 divided by speed of size C vacuum pump, 400, results in the figure 4, the size in inches of the pulley for the vacuum pump.

PRICES OF PULLEYS

3 to 6-inch diameter,	-	-	-	\$1.75
7 " 8 "	"	-	-	2.00
9 " 10 "	"	-	-	2.25
11 " 12 "	"	-	-	2.50
13 " 14 "	"	-	-	2.75
15 " 16 "	"	-	-	3.00
17 " 18 "	"	-	-	3.50
19 " 20 "	"	-	-	4.00

No pulley will exceed 3 inches in width of face and the proper width will be sent for the pump selected. Prices of loose and tight pulleys on application.

OIL FOR LUBRICATION OF VACUUM PUMPS

ECONOMY of power consumption and smooth running depends upon the proper lubrication of the cylinder as well as the shaft bearings. The use of our oil is specially recommended.

CYLINDER OIL

For Interior of Cylinder

1-Gallon Can	-	-	\$1.20
2 " "	-	-	2.25
5 " "	-	-	5.00



MACHINE OIL

For Shaft Oil Wells

1-Gallon Can	-	-	\$0.90
2 " "	-	-	1.75
5 " "	-	-	4.00

STELLITE.
KOKOMO, IND.

Replying to your letter, I will say that the blower purchased from you nearly two years ago has given excellent satisfaction. It has never given a moment's trouble, and seems to deliver the same amount of air as when first installed.

Tear off along this line

LEIMAN BROS.,

62 JOHN STREET, NEW YORK.

Gentlemen:

Please send via

Vacuum Pump

With

Oil Cup.

With

Continuous Oiling System.

With

Pulley.

Inches.

With

Gallon

Cylinder Oil.

With

Gallon

Machine Oil.

With

Vacuum Relief Valve.

(Cross out items not wanted.)

For which

enclose

for

(P. O. or Express Money Order.)

\$

Name

Street Address

City and State

191

(State what Railroad or Express Co.)

Size

SOME USERS
OF
LEIMAN BROS. ROTARY POSITIVE
VACUUM PUMPS
SELECTED AT RANDOM

Harris Automatic Press Co.,
Niles, O.
Grand Hotel, New York.
Brooklyn Auto Vacuum Cleaning
Co.
Montague Mailing Machine Co.,
Chattanooga, Tenn.
Avenue Carriage Wks., St. Joseph,
Mo.
Standard Vulcanizing & Tire Co.,
Nashville, Tenn.
Abbott Bros., Mason City, Ills.
Backus Water Motor Co., Newark,
N. J.
National Vacuum Sales Co., Balti-
more, Md.
F. S. R. Prentiss, San Francisco,
Calif.
H. W. Cleland, Wilkesburg, Pa.
Geo. Loos, Grafton, N. D.
Newark Wrapping Machine Co.,
Newark N. J.
Strickland Vacuum Cleaning Co.,
New York.
C. E. Mincer, Hamburg, Iowa.
Arkell & Smith, Canajoharie, N. Y.
James Proctor, Lorain, O.
Sheridan Iron Wks., Champlain,
N. Y.
H. C. Low, Atcheson, Kans.
Amphion Co., Syracuse, N. Y.
Geo. Feigel, Jr., Austin, Texas.
Colonial Theatre, New York.
Alhambra Theatre, New York.
Auto Piano Co., New York.
Chas. A. Maynard, Westboro, Mass.
Toronto Hydroelectric Co., Toronto,
Canada.
Atcheson, Topeka & Santa Fe R. R.
Co., Los Angeles, Calif.
Sprague Electric Works, Bloom-
field, N. J.
Shedd & Wright Mfg. Co., Minne-
apolis, Minn.
C. J. & F. E. Briner, St. Louis,
Mo.
Beck Clothing Co., Jamestown,
N. D.
W. P. Brinton, Jr., Bradford, Pa.
Onward Mfg. Co., Berlin, Canada.
St. Louis Hardware Mfg. Co., St.
Louis, Mo.
J. W. Braid, Nashville, Tenn.
T. E. Calvert, Lincoln, Neb.

Jay C. Moore, Eugene, Oregon.
A. J. Eisenmayer, Springfield, Mo.
Shredwood Curtain Co., Worcester,
Mass.
S. K. French, Brooklyn, Mich.
Alamo Engine & Supply Co., Oma-
ha, Neb.
Cushman Motor Works, Lincoln,
Neb.
Roswin Mfg. Co., Buffalo, N. Y.
Indiana Fan Co., Indianapolis, Ind.
Electro Light & Starter Co., In-
dianapolis, Ind.
Augustine Rotary Engine Co., To-
ronto, Canada.
Butler Engine & Foundry Co., But-
ler, Pa.
Metropolitan Street Railway Co.,
St. Louis, Mo.
Metropolitan Street Railway Co.,
New York.
University of Vermont, Burlington,
Vt.
York Currugating Co., York, Pa.
Elliott Co., Cambridge, Mass.
Westinghouse Elec. & Mfg. Co.,
Pittsburg, Pa.
Emerson Elec. & Mfg. Co., St.
Louis, Mo.
Lufkin Rule Co., Saginaw, Mich.
United Wireless Telegraph Co.,
New York.
Standard Oil Co., New York.
General Electric Co., Lynn, Mass.
Western Electric Co., Hawthorn,
Ills.
Omaha Auto Vacuum Cleaning Co.,
Omaha, Neb.
Hotel Sacramento, Sacramento, Cal.
Board of Education, Newark, N. J.
Youngstown Auto & Repair Co.,
Youngstown, O.
McDonogh School, Baltimore, Md.
Bedell & Co., Newark, N. J.
U. S. Glass Co., Pittsburgh, Pa.
Water Dept., City of St. Louis,
Mo.
McKinley Manual Training School,
Washington, D. C.
University of Minnesota.
University of Wisconsin.
Columbia University.
Buffalo Blue Print Co., Buffalo,
N. Y.
Pratt Institute, Brooklyn, N. Y.